

REMARKS

The Office Action of January 11, 2005 has been received and its contents carefully considered. The rejections are respectfully traversed for the reasons discussed below.

Section 3 of the Office Action rejects independent claims 1, 4, and 25 (along with various dependent claims) for anticipation by US patent 5,122,791 to Gibbons et al (which will hereafter be called simply "Gibbons"). The Gibbons reference discloses a ferroelectric LCD that is back-lit with flashes of light that vary depending upon the rank of the bits that are being displaying.

Step (b) of claim 1 recites "steadily exposing the spatial light modulator to light of the first color component during substantially the entire time that step (a) is conducted ...". Since step (a) recites, "for each bit rank of the first color component of the frame, turning pixels of the spatial light modulator on or off in accordance with values of the video words of the first color component for the respective bit rank" (emphasis supplied), step (b) requires that the spatial light modulator be steadily exposed to light of the first color component during substantially the entire time while all of the bit ranks for the first color component are displayed.

The Office Action, referring to 8Ig, 4Ig, 2Ig, and Ig in Gibbons' Figure 2, takes the position that Gibbons teaches steadily exposing a spatial light modulator to light of a first color component during substantially the entire time that step (a) is conducted. Applicant respectively disagrees. In Gibbons' Figure 2, step (a) of claim 1 for the first color component (here, green) would correspond to the period marked "GREEN IMAGE." What Figure 2 shows is four discrete flashes of light during the "GREEN IMAGE" period, not a steady exposure. The rejection of claim 1 for anticipation should therefore be withdrawn.

Indeed, Gibbons actually teaches against what is recited in claim 1. The paragraph at column 4, lines 10-33, for example, explicitly states that Gibbons' lights are turned on and off during the "GREEN IMAGE" period. An ordinarily skilled person who wanted to improve some aspect of Gibbons' display would not have had any motivation to ignore this teaching and, instead, use a steady exposure in accordance with step (b) of claim 1.

Independent claim 4 includes a step (b) of "substantially steadily exposing the spatial light modulator to light that varies substantially in intensity while step (a) is conducted," and independent claim 25 includes a step (c) of "steadily exposing the spatial light modulator to light of the first color component while steps (a) and (b) are conducted ...". Accordingly, it is respectively submitted that independent claims 4 and 25, like claim 1, are neither anticipated by Gibbons nor rendered obvious by this reference.

Section 4 of the Office Action rejects independent claim 34 (along with depend the claim 35) for anticipation by U.S. patent 5,986,640 to Baldwin et al (which will hereafter be called simply "Baldwin"). Claim 34 includes a step (b) which specifies that the bit ranks of the video words describing a given frame are displayed in a predetermined order. Step (c) then recites, "displaying the bit ranks of the video words describing the next frame ... in a different order." The Office Action refers to Baldwin's Figure 4d, and takes the position that Baldwin display is bit ranks in the first frame of Figure 4d in one order, and bit ranks in the second frame in a different order.

It is respectively submitted that the Office Action has miss-interpreted what is shown in Baldwin's Figure 4d. In the first frame shown in Figure 4d, the video word for controlling a given micromirror is 10000, while the video word for controlling the given micromirror in the second frame is 01111. This is only a small change, but it nevertheless leaves an entire frame period when the micromirror reflects no light. Similarly in Baldwin's Figure 4e, a frame in which the video word for the given micromirror is 01111 might be followed by a frame in which the video word for the same micromirror is 10000, leading to a bright flash. This can lead to twinkling pixels, as Baldwin explains that the passage from column 4, line 45 to column 5, line 44.

Baldwin neither discloses nor suggests "displaying the bit ranks of the video words describing the next frame ... in a different order," as recited in step (c) of claim 34.

Section 7 of the Office Action rejects independent claims 8 and 38 (along with two dependent claims) for obviousness on the basis of U.S. patent 5,448,314 to Heimbuch et al (hereafter simply "Heimbuch") in view of U. S. patent 5,706,061 to Marshall et al (hereafter simply "Marshall") . In the Heimbuch reference, a color wheel is rotated faster than the frame

repetition rate in order to reduce color separation of moving images. In the Marshall reference, a lighting unit (a lamp and color wheel, or different color lasers) is controlled so as to reduce undesired artifacts in the image.

Step (b) of claim 8 recites, "discontinuously exposing the digital micromirror device to brief-duration flashes of light, the flashes having intensities that depend on the respective bit rank." The Office Action draws attention to Heimbuch's Figures 7a and 7b for this. However, the passage at Heimbuch's column 7, line 64 to column 8, line 38 indicates that these figures illustrate the loading of video words into what the reference calls a "split reset" DMD. See also Heimbuch's column 3, lines 51-53 (briefly describing Figures 7a and 7b as illustrating "a technique for packing bit patterns for a split reset system..."). The reference either discloses nor suggests "discontinuously exposing the digital micromirror device to brief-duration flashes of light, the flashes having intensities that depend on the respective bit rank" in accordance with step (b) of claim 8.

Moreover, claim 8 includes a "wherein" clause which recites that "step (b) comprises exposing the digital micromirror device to flashes impinging on the digital micromirror device from a first ration, and also to flashes impinging on the digital micromirror device from a second direction, and also to flashes impinging on the digital micromirror device from a third direction." This is not suggested by Heimbuch. Furthermore, even though Marshall's Figures 9 illustrates different light sources, nothing in the reference would suggest that the light which these light sources emit impinges on Marshall's DMD from three different directions.

Independent claim 38 provides generally that light of three different colors impinges on a digital micromirror device from three different directions. An ordinarily skilled person would not be likely to think that the use of three separate light sources in Marshall's Figure 9 implies that the light impinges from three different directions. Marshall's elements 176 and 178 (in Figure 9) appears to be dichroic mirrors that combine the three colors (see column 12, lines 6-8), so that they all impinge on the Marshall's DMD from the same direction. It is respectfully submitted that nothing in the Heimbuch and Marshall references would have provided an incentive for skilled person to arrive at the method recited in claim 38.

Since the remaining claims that have been rejected depend from the independent claims discussed above and recite additional limitations to further defined the invention, they are patentable along with their independent claims that need not be further discussed.

For the foregoing reasons, it is respectively submitted that this application is now in condition for allowance. Reconsideration of the application is therefore respectively requested.

Respectfully submitted,



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